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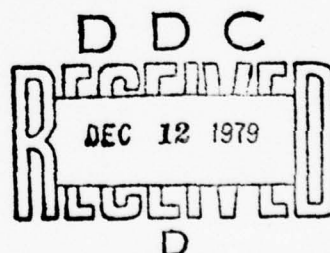
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## TANK CREW STABILITY AND TANK GUNNERY PERFORMANCE

Newell K. Eaton

FORT KNOX FIELD UNIT

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Newell K. Eaton

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Submitted by:  
Donald F. Haggard, Chief  
FORT KNOX FIELD UNIT

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## TANK CREW STABILITY AND TANK GUNNERY PERFORMANCE

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### INTRODUCTION

Tank crew stability/turbulence has long been a concern of armor commanders. In assessing the potential effects of crew turbulence several variables must be considered. These are job familiarity, personnel familiarity, and equipment familiarity. Job familiarity is related to the time an individual has to learn the duties associated with his position. Due to crew turbulence many units must reassign personnel to new, more demanding positions, to fill crews for periodic training. Personnel familiarity is related to the time individuals trained in their specific positions have to learn to work together as a crew. Because of turbulence many crews are together for only short periods prior to training exercises. Finally, equipment familiarity is related to the time crewmen have to learn the peculiarities of their own tanks. Many crews find they must work on tanks with which they are not familiar. Of course, these variables are not independent. They can, and in the field usually do, occur in combination.

A review of the literature on tank crew turbulence revealed one study investigating the degree of crew turbulence in armor units and the effects of job familiarity on crew performance. Data on the degree of turbulence in 6 armor battalions (4 CONUS, 2 USAREUR) were presented by Larson, Earl, and Henson (1976). They found high levels of turbulence in terms of changes in duty position, and changes in personnel assigned positions in particular tank crews. Tank commanders typically changed duty position least (0-20% over 4-6 months), while drivers, gunners, and loaders changed duty positions quite often (33-88% over 4-6 months). Changes in personnel assigned to positions in specific tank crews was high for all positions (56-95% over 4-6 months). They also found a positive relation between Table VIII scores and time in position for tank commanders, gunners, and drivers.

Although fairly comprehensive data on the degree of crew turbulence was provided by Larson et al., the data was collected several years ago and may not represent today's armor forces. And the effects of crew turbulence were not fully explored. Concern over the magnitude and effects of crew turbulence on tank gunnery training were expressed to ARI by numerous individuals in 1977, and research involving experimental manipulation of several degrees of turbulence was planned. In the interim this correlational research was designed and conducted in conjunction with tank crew assignment research ongoing with five armor battalions in USAREUR.

### SPECIFIC OBJECTIVES

There were two specific objectives of this research. First was to determine the degree of crew turbulence in tank crews in USAREUR armor battalions. Second was to determine the relationship between measures of crew turbulence in the USAREUR battalions and tank gunnery performance on the Tank Crew Qualification Course (Table VIII) at Grafenwoehr, FRG.



## METHOD

### RESEARCH PARTICIPANTS

Research participants were crewmen in the 255 tank crews from five armor battalions in a USAREUR armor division. Crewman in 211 crews completed a tank crew stability questionnaire and were included in the sample.

### QUESTIONNAIRE

A tank Crew Stability Questionnaire (PT 5188) was constructed to provide various measures of crew and crewman stability. The questionnaire included 22 questions. The tank commander was asked to answer the following questions about the crew:

1. How many months have you and your complete crew been assigned together, with you as TC, your current gunner assigned as your gunner, your current driver assigned as your driver, and your current loader assigned as your loader?
2. How many months have you and your complete crew been assigned together, with you as TC, your current gunner assigned as your gunner, your current driver assigned as your driver, and your current loader assigned as your loader, on the tank you used, or will use, to fire Table VIII?
3. How many months have you and your complete crew actually been able to train together, with you as TC, your current gunner as gunner, your current driver as driver, and your current loader as loader?

He was also asked to answer the following questions about himself and his gunner:

1. How many months have you and your current gunner been assigned together, with you as TC and your current gunner as gunner?
2. How many months have you and your current gunner been assigned together, with you as TC and your current gunner assigned as your gunner, on the tank you used, or will use, to fire Table VIII?
3. How many months have you and your current gunner actually been able to train together, with you as TC, and your current gunner as gunner?

Each tank commander was then asked to answer the following questions about himself:

1. How many months have you been assigned as the TC on the tank you used, or will use, to fire Table VIII?

2. How long have you been assigned the duties of TC, regardless of the tank, crew, or company you may have been in?

3. How long have you actually had to train in the duties of TC, regardless of the tank, crew, or company you may have been in?

4. How long have you served in M60 tanks, regardless of the duty position you held?

Then each gunner, driver, and loader were asked to answer the same four questions (which were rephrased to make them appropriate for the position). The Tank Crew Stability Questionnaire is included in Appendix A.

#### TANK GUNNERY MEASURES

Criterion data collected on Table VIII were opening time on each engagement and hit/miss data for each main gun round. To help insure completeness and accuracy of Table VIII hit and time data three sources were used. First was data taken from the records maintained by each battalion. These were obtained at Grafenwoehr during the battalion firing. Second was data collected by a member of a data collection team during the tank crew's debriefing conducted after Table VIII. Data collection team members were enlisted men detailed by the battalion to assist ARI representatives in data collection. A data collection team member was present during each debriefing to acquire immediate hit/time data from the scorer (usually a platoon leader) and obtain answers to any questions about the conduct of the Table (misfires, targets which did not "pop-up", etc.). The third source was a tape-recording of each Table VIII run. The tape recordings included crew intercom communication, firing tank-to-control tank communication, and tower-to-tank communication. To make the recordings a data collection team member connected a cassette recorder to the firing tank's audio-frequency amplifier (AM 1780/VRC). Recordings were used to verify time measurements, answer questions about any unusual circumstances such as misfires, nonappearance of targets, etc., and to resolve any discrepancies between data collected in debriefings and data taken from battalion score sheets.

## RESULTS

### DATA HANDLING

Tank Crew Stability Questionnaire. Each questionnaire was checked for completeness upon receipt. Incomplete questionnaires were returned to the crew's company for completion. Using this procedure 211 questionnaires (83% of the questionnaires possible from the sample) were available for analysis. Of these 198 (78%) were complete. Crewmen's responses were converted to months for all items and tabulated for analysis. Because data was tabulated to two digits a maximum of 99 months (8 years 3 months) was permissible on any item. Any respondent answering with more than 8 years 3 months was assigned a score of 99 months.

Tank Gunnery Measures. Gunnery hit/miss and opening time raw scores were tabulated for each tank and cross-checked to insure accuracy by using battalion scoresheets, debriefing scoresheets, and the tape recordings. From these the following summary variables were computed for each tank:

#### Summary Variables

1. Mean main gun opening time - day.
2. Mean main gun opening time - night.
3. Mean main gun opening time - day and night.
4. Total first round main gun hits - day.
5. Total first round main gun hits - night.
6. Total first round main gun hits - day and night.
7. Total main gun targets hit - day.
8. Total main gun targets hit - night.
9. Total main gun targets hit - day and night.

Because Table VIII gunnery was conducted by each of the five battalions according to slightly different procedures the possibility existed that battalions would exhibit significant differences on the summary gunnery variables above, necessitating use of standardized rather than summary gunnery variables in ensuing analyses. Accordingly, nine ANOVAs were conducted to determine whether significant between-battalion differences existed. An alpha-level of .01 was chosen. Six of the nine analyses (variables 1-4, 6, and 7) yielded significant results. Because of the between-battalion differences, intercorrelation matrices for the nine summary variables were computed overall, and separately by battalion for use in choosing final gunnery criteria.



Inspection of these matrices indicated a high correlation between main gun hit measures (variables 4-9), and between opening time measures (variables 1-3), and low correlation between the various hit and time measures. Because of these relationships and because of their significance to tank gunnery, day and night mean opening time (variable 3) and total main gun targets hit (variable 9) were chosen as the bases for the gunnery criterion measures. To eliminate between-battalion differences indicated by the ANOVAs, standardized time and hit scores were computed for each tank in each battalion. These were used as criteria for all subsequent analyses.

#### DESCRIPTIVE STATISTICS

Descriptive statistics, including frequency distribution, mean, median, mode, standard deviation, standard error, and semi-interquartile range were computed for all items on the Tank Crew Stability Questionnaire. A summary of these descriptive statistics, including abbreviated item designation, mean, median, standard deviation and semi-interquartile range, is provided in Table 1. Note that due to the two-digit data tabulation, mean and standard deviation statistics are somewhat conservative for items 8, 9, and 10. There were 14-18% of the TCs who answered these items with more than 8 years 3 months and were arbitrarily assigned a maximum score of 99. The median and semi-interquartile range, of course, were unaffected by this procedure. Due to the fact that the distributions for all items were positively skewed, rather than normally distributed, the median and semi-interquartile range may be the more appropriate measures of central tendency and variability. Complete descriptive statistics and frequency distributions are provided in Appendix B.

#### TURBULENCE - GUNNERY RELATIONSHIPS

In order to assess the relationship between crewmen's responses on the Tank Crew Stability Questionnaire and Table VIII performance, correlations were computed between crewmen's responses, in months, and the Table VIII opening time and targets hit criteria described above. The results of these correlations are shown in Table 2. Because of the large number of correlations computed, and the relatively large sample, an alpha level of .01 was chosen for significance.

Responses on many of the turbulence questionnaire items were positively skewed. In addition, a linear relation may not be expected between performance and crew/crewman experience. One might expect greater performance increments associated with experience increments



Table 1

## DESCRIPTIVE STATISTICS

Abbreviated Item Designation (N = )	Mean	Median	Standard		Semi Inter- Quartile Range
			Deviation	Quartile	
1. Months crew assigned together (211)	2.2	1.2	3.4		1.3
2. Months crew assigned on Table VIII tank (210)	1.9	1.1	2.7		1.2
3. Months crew trained together (211)	1.5	.8	2.5		.9
4. Months TC and GR assigned together (211)	3.5	2.6	3.9		2.1
5. Months TC and GR assigned on Table VIII tank (211)	3.4	2.5	3.8		2.0
6. Months TC and GR trained together (211)	2.9	1.9	2.4		1.8
7. Months TC on Table VIII tank (211)	6.8	4.1	6.9		3.9
8. Months TC assigned as TC (208)	(36.6)*	24.3	(34.3)*		26.6
9. Months TC trained as TC (209)	(38.1)*	24.4	(34.6)*		26.1
10. Months TC on M60 tanks (208)	(47.7)*	45.5	(33.2)*		26.1
11. Months GR on Table VIII tank (207)	5.3	3.4	6.1		2.9
12. Months GR assigned as GR (209)	12.6	8.9	12.1		7.9
13. Months GR trained as GR (209)	13.5	8.4	14.9		9.4
14. Months GR on M60 tanks (208)	27.4	24.3	16.8		8.6
15. Months DR on Table VIII tank (200)	5.4	3.2	6.0		3.7
16. Months DR assigned as DR (204)	11.1	7.7	11.5		7.9
17. Months DR trained as DR (204)	11.2	7.6	11.6		7.9
18. Months DR on M60 tanks (199)	16.3	12.5	14.6		9.4
19. Months LR on Table VIII tank (198)	4.0	2.1	5.1		2.6
20. Months LR assigned as LR (199)	7.3	4.1	8.1		4.7
21. Months LR trained as LR (200)	7.4	4.0	8.6		4.9
22. Months LR on M60 tanks (199)	13.4	9.3	12.2		8.6

\* Due to tabulation procedure mean and standard deviation statistics are conservative, for item 8, 9, and 10.

Table 2

## TURBULENCE - GUNNERY RELATIONSHIPS

Abbreviated Item Designation	Analysis of Raw Scores With:		Transformed Scores With:	
	Opening Time	Targets Hit	Opening Time	Targets Hit
1. Months crew assigned together	-.07	+.02	-.14	+.03
2. Months crew assigned on Table VIII tank	-.09	-.01	-.12	+.03
3. Months crew trained together	-.09	-.02	-.12	-.01
4. Months TC and GR assigned together	-.11	+.04	-.15	+.02
5. Months TC and GR assigned on Table VIII tank	-.10	+.04	-.14	+.04
6. Months TC and GR trained together	-.12	+.02	-.19*	+.02
7. Months TC on Table VIII tank	-.20*	+.03	-.21*	+.02
8. Months TC assigned as TC	-.15	-.02	-.28**	+.03
9. Months TC trained as TC	-.11	-.03	-.23**	-.01
10. Months TC on M60 tanks	-.10	-.04	-.13	-.06
11. Months GR on Table VIII tank	-.05	.00	-.12	-.02
12. Months GR assigned as GR	+.03	+.15	.00	+.10
13. Months GR trained as GR	+.07	+.19*	+.05	+.10
14. Months GR on M60 tanks	+.01	+.14	-.03	+.11
15. Months DR on Table VIII tank	-.07	+.06	-.10	-.10
16. Months DR assigned as DR	-.13	+.06	-.14	-.02
17. Months DR trained as DR	-.13	+.07	-.07	-.02
18. Months DR on M60 tanks	-.16	+.01	-.17	-.01
19. Months LR on Table VIII tank	-.08	-.04	-.11	-.01
20. Months LR assigned as LR	+.03	-.09	+.03	-.05
21. Months LR trained as LR	+.03	-.05	-.01	-.03
22. Months LR on M60 tanks	-.01	-.04	-.01	-.00

184 &lt; N &lt; 211

\*p &lt; .01

\*\* p &lt; .001

for relatively inexperienced crews/crewmen than with equal experience increments for more experienced crews/crewmen. Therefore, a log transformation was computed for questionnaire responses wherein the transformed score equaled  $\log_{10}(\text{raw score} + c)$ . The constant  $c$  was determined by examination of frequency distributions of transformed scores. Various constants from 0.2 to 3.0 were evaluated, and  $c$  which best provided a median transformed score equidistant from the ends of the distribution was chosen. By this procedure more symmetrical distributions were obtained for all variables. Correlations were then computed between the transformed questionnaire responses and the opening time and targets hit criteria. Constants chosen, and response-criterion correlations, are shown in Table 2. Again an alpha level of .01 was chosen for significance.

Three kinds of relationships proved to be significant. First, the more time a TC and his gunner had trained together the more quickly the crew opened fire. Second, the more experience the TC had, in terms of his assignment as TC on his Table VIII tank, his assignment as TC, and his training as TC, the more quickly the crew opened fire. Third, the more training a gunner received the more targets his tank hit.

#### DISCUSSION

There were two objectives of this research. First was to determine the degree of tank crew stability in five armor battalions in USAREUR. The second was to determine the relation between tank crew stability and tank gunnery performance on the Tank Crew Qualification Course, Table VIII, at Grafenwoehr, FRG.

The data presented above under Descriptive Statistics indicated that there was considerable turbulence in the battalions observed. While complete crews normally had been together 1-2 months, as shown by mean and median statistics, there was considerable variation. Many had been together more than 2 months while others had been together less than 1 month. The same pattern existed for tank commander/gunner turbulence. Typically, tank commanders and gunners had been together 2-3 months, but variation was great, with many together less than one month and many others together 4 months or more.

The data indicated that most tank commanders had a moderate level of experience as tank commanders, typically 1-3 years. Again, there was great variation in experience. Tank commanders typically had been assigned to their Table VIII tank 3-6 months, but wide variation was evident on this variable also.

Data for remaining crewmembers, gunners, drivers, and loaders, followed the same pattern, but with progressively less experience at each position. Results indicated gunners, drivers, and loaders typically had 6-12, 6-10, and 3-6 months experience, respectively. These crewmen had typically been assigned to their position on their Table VIII tank 1-5 months, depending on position. As with tank commanders, variation was great, with many gunners, drivers, and loaders assigned more than 6 months, and many others less than one month.

Overall, the descriptive statistics indicate that typical crewmen in these battalions had a moderate level of experience as armor crewmen, and some experience in their particular position. There were, however, great variations between individual crewmen in terms of their experience in their position, and with M60 tanks. Most had been assigned to their position, on their Table VIII tank, a relatively short time, although variation there was also considerable. The battalions underwent a relatively high degree of overall crew turbulence, and tank commander-gunner turbulence.

Observation of the relation between crew stability measures and gunnery performance was quite instructive. The results indicated no relation between gunnery performance and the time the entire crew had been together, but did indicate that the longer the tank commander and gunner had trained together the more rapidly they opened fire on their targets. Thus, while unit commanders may not need to stress whole-crew stability, some emphasis placed on tank commander-gunner stability may yield tank crews which can service targets more rapidly. Of course, these findings are limited by the degree of turbulence observed within the battalions, and would not necessarily generalize to situations where there might be considerably less turbulence. In these battalions, however, the range of crew and tank commander-gunner turbulence was in keeping with the findings of Larson et al. The battalions seemed to fairly represent current US armor battalions. While whole-crews having a significantly greater amount of experience together may indeed perform better than those typical of crews in the battalions participating in this research, units having such crews in any sizable numbers are not known to this author.

Tank commander experience, in that position, was related to gunnery performance. The longer a tank commander had been assigned to his tank, the longer he had been assigned as a tank commander, and the longer he had trained as tank commander, the faster his opening time on Table VIII. These relationships can best be explained in terms of the development of the tank commander's skill, and his familiarity with the equipment. It would seem logical that such relations arise. The tank commander has more control over time-to-fire, in terms of his target acquisition, gun-laying, ranging, and fire command, than any other crewmember.



While no relation was observed between tank commanders variables and number of targets hit, that can probably be explained by the fact that it is the gunner who must lay on targets initially, and make adjusted lays based on the various fire adjustment methods. The tank commander has little direct control over his gunner on those actions. In addition, because the ranges to targets were fairly well known by the tank crews, any effects of differences in tank commanders ranging skills would have been attenuated.

From the discussion one might expect to observe a relation between gunner training and number of targets hit. Such a relation was revealed by the analysis. The longer a gunner had trained as gunner the more targets his tank hit on Table VIII. Although no relation was observed between gunner variables and opening time such a finding may be explained in terms of the tank commanders greater control on that variable.

No significant relationships were observed between driver or loader variables and either time or targets hit on Table VIII. These results may also be readily explained. In most cases the ammunition to be used was announced and loaded prior to the beginning of an engagement, thus limiting the effect a loader could have on opening times. And loaders appeared to be consistent in identifying and loading the ammunition correctly, thus limiting the effect of loader variables on the targets hit criterion. Because engagements did not begin until the tank was in position, the driver's contribution to hits and time was limited.

Overall, the findings for individual crewmembers indicate that experience of tank commanders and gunners plays a small, but significant, part in reducing opening time on Table VIII, and increasing the number of targets hit. Such a finding is, of course, in concurrence with the beliefs of the majority of the armor community. It would seem to underscore the need for emphasizing the training, and retention, of tank commanders and gunners in their respective positions.

#### REFERENCES

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Larson, J. A., Earl, W. K., and Henson, V. A. Assessment of US tank crew training. TRADOC Combined Arms Test Activity Test Report FM 331, Ft Hood, Texas, 15 July 1976.

APPENDIX A

TANK CREW STABILITY QUESTIONNAIRE (PT 5188)

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# TANK CREW STABILITY QUESTIONNAIRE

TCs, please fill in your name, tank, company, Bn, gunner's name, driver's name, and loader's name. Then complete questions #1-10.

Have your gunner complete questions #11-14, your driver complete questions #15-18, and your loader complete questions #19-22.

When you and your gunner, driver, and loader have all completed their questions check the questionnaire to insure that all 22 questions have been answered. Then give questionnaire to the platoon sergeant who should give it to the company first sergeant.

Thank you for completing the questionnaire.

TC name \_\_\_\_\_ Tank \_\_\_\_\_ Company \_\_\_\_\_ Bn \_\_\_\_\_

What is your Table VIII gunner's name \_\_\_\_\_

What is your Table VIII driver's name \_\_\_\_\_

What is your Table VIII loader's name \_\_\_\_\_

In answering the following questions count only time in armor companies. Do not count time in 11E AIT or OSUT, or time in NCO courses, Master Gunner Courses, etc.

1. How many months have you and your complete crew been assigned together, with you as TC, your current gunner assigned as your gunner, your current driver assigned as your driver, and your current loader assigned as your loader? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
13    14    15    16    17    18    19    20    21    22    23    24 or more

2. How many months have you and your complete crew been assigned together, with you as TC, your current gunner assigned as your gunner, your current driver assigned as your driver, and your current loader assigned as your loader, on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
13    14    15    16    17    18    19    20    21    22    23    24 or more

3. How many months have you and your complete crew actually been able to train together, with you as TC, your current gunner as gunner, your current driver as driver, and your current loader as loader? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
13    14    15    16    17    18    19    20    21    22    23    24 or more



4. How many months have you and your current gunner been assigned together, with you as TC and your current gunner as gunner? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
                         13   14   15   16   17   18   19   20   21   22   23   24 or more

5. How many months have you and your current gunner been assigned together, with you as TC and your current gunner assigned as your gunner, on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
                         13   14   15   16   17   18   19   20   21   22   23   24 or more

6. How many months have you and your current gunner actually been able to train together, with you as TC, and your current gunner as gunner? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
                         13   14   15   16   17   18   19   20   21   22   23   24 or more

7. How many months have you been assigned as the TC on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
                         13   14   15   16   17   18   19   20   21   22   23   24 or more

8. How long have you been assigned the duties of TC, regardless of the tank, crew, or company you may have been in?

\_\_\_\_\_ YEARS    \_\_\_\_\_ MONTHS

9. How long have you actually had to train in the duties of TC, regardless of the tank, crew, or company you may have been in?

\_\_\_\_\_ YEARS    \_\_\_\_\_ MONTHS

10. How long have you served in M60 tanks, regardless of the duty position you held?

\_\_\_\_\_ YEARS    \_\_\_\_\_ MONTHS

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HAVE YOUR GUNNER FILL OUT THE NEXT FOUR QUESTIONS.

### GUNNER'S QUESTIONS

In answering the following questions count only time in armor companies. Do not count time in 11E AIT or OSUT, or time in NCO courses, Master Gunner Courses, etc.

11. How many months have you been assigned as the gunner on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
13    14    15    16    17    18    19    20    21    22    23    24 or more

12. How long have you been assigned the duties of gunner, regardless of the tank, crew, or company you may have been in?

\_\_\_\_\_ YEARS    \_\_\_\_\_ MONTHS

13. How long have you actually had to train in duties of gunner, regardless of the tank, crew, or company you may have been in?

\_\_\_\_\_ YEARS    \_\_\_\_\_ MONTHS

14. How long have you served on M60 tanks, regardless of the duty position you held?

\_\_\_\_\_ YEARS    \_\_\_\_\_ MONTHS

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HAVE YOUR DRIVER FILL OUT THE NEXT FOUR QUESTIONS.

### DRIVER'S QUESTIONS

In answering the following questions count only time in armor companies. Do not count time in 11E AIT or OSUT, or time in NCO courses, Master Gunner Courses, etc.

15. How many months have you been assigned as the driver on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month    1    2    3    4    5    6    7    8    9    10    11    12  
13    14    15    16    17    18    19    20    21    22    23    24 or more

16. How long have you been assigned the duties of tank driver, regardless of the tank, crew, or company you may have been in?

\_\_\_\_\_ YEARS    \_\_\_\_\_ MONTHS

17. How long have you actually had to train in duties of tank driver, regardless of the tank, crew, or company you may have been in?

\_\_\_\_\_ YEARS    \_\_\_\_\_ MONTHS

18. How long have you served on M60 tanks, regardless of the duty position you held?

\_\_\_\_\_ YEARS \_\_\_\_\_ MONTHS

HAVE YOUR LOADER FILL OUT THE NEXT FOUR QUESTIONS.

LOADER'S QUESTIONS

In answering the following questions count only time in armor companies. Do not count time in 11E AIT or OSUT, or time in NCO courses, Master Gunner Courses, etc.

19. How many months have you been assigned as the loader on the tank you used, or will use, to fire Table VIII? (Circle one)

Less than 1 month . 1 2 3 4 5 6 7 8 9 10 11 12  
13 14 15 16 17 18 19 20 21 22 23 24 or less

20. How long have you been assigned the duties of loader, regardless of the tank, crew, or company you may have been in?

\_\_\_\_\_ YEARS \_\_\_\_\_ MONTHS

21. How long have you actually had to train in duties of loader, regardless of the tank, crew, or company you may have been in?

\_\_\_\_\_ YEARS \_\_\_\_\_ MONTHS

22. How long have you served on M60 tanks, regardless of the duty position you held?

\_\_\_\_\_ YEARS \_\_\_\_\_ MONTHS

Loader - When you have completed questions #19-22 return the questionnaire to your TC.

Thank you.

APPENDIX B

COMPLETE DESCRIPTIVE STATISTICS AND FREQUENCY DISTRIBUTIONS



# TANK CREW STABILITY QUESTIONNAIRE ITEMS

<u>Variable code</u>	<u>Description</u>
185	Months crew assigned together
186	Months crew assigned together on tank used for Table VIII
187	Months crew trained together
188	Months Tank Commander and Gunner assigned together
189	Months Tank Commander and Gunner assigned together on tank used for Table VIII
190	Months Tank Commander and Gunner trained together
191	Months Tank Commander on Table VIII tank
192	Months assigned as Tank Commander
193	Months trained as Tank Commander
194	Months Tank Commander was on M60 tanks
195	Months Gunner on Table VIII tank
196	Months assigned as Gunner
197	Months trained as Gunner
198	Months Gunner was on M60 tanks
199	Months Driver on Table VIII tank
200	Months assigned as Driver
201	Months trained as Driver
202	Months Driver on M60 tanks
203	Months Loader on Table VIII tank
204	Months assigned as Loader
205	Months trained as Loader
206	Months Loader on M60 tanks

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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR185

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0.	79	37.4	37.4	37.40
	1.	37	17.5	17.5	55.00
	2.	31	14.7	14.7	69.70
	3.	27	12.8	12.8	82.50
	4.	7	3.3	3.3	85.80
	5.	8	3.8	3.8	89.60
	6.	8	3.8	3.8	93.40
	7.	4	1.9	1.9	95.30
	8.	1	.5	.5	95.70
	9.	1	.5	.5	96.20
	10.	2	.9	.9	97.20
	12.	3	1.4	1.4	98.60
	19.	1	.5	.5	99.10
	24.	2	.9	.9	100.00
		-----	-----	-----	
	TOTAL	211	100.0	100.0	

MEAN	2.199	STD ERR	.236	MEDIAN	1.210
MODE	.000	STD DEV	3.429	VARIANCE	11.760
KURTOSIS	16.836	SKEWNESS	3.537	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 211 MISSING CASES 0

FILE TANK (CREATION DATE = 20 DEC 77)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0.	80	37.9	38.1	38.10
	1.	41	19.4	19.5	57.60
	2.	32	15.2	15.2	72.90
	3.	26	12.3	12.4	85.20
	4.	5	2.4	2.4	87.60
	5.	8	3.8	3.8	91.40
	6.	5	2.4	2.4	93.80
	7.	3	1.4	1.4	95.20
	8.	3	1.4	1.4	96.70
	9.	1	.5	.5	97.10
	10.	2	.9	1.0	98.10
	12.	3	1.4	1.4	99.50
	19.	1	.5	.5	100.00
	9999.	1	.5	MISSING	100.0
	TOTAL	211	100.0	100.0	

MEAN	1.914	STD. ERR.	.185	MEDIAN	1.110
MODE	.000	STD. DEV.	2.685	VARIANCE	7.208
KURTOSIS	9.599	SKEWNESS	2.624	RANGE	19.000
MINIMUM	.000	MAXIMUM	19.000		
VALID CASES	210	MISSING CASES	1		

~~THIS PAGE IS BEST QUALITY PRACTICAL~~  
FROM JUNE 1960 TO DDC

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR187

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0.	93	44.1	44.1	44.10
	1.	45	21.3	21.3	65.40
	2.	32	15.2	15.2	80.60
	3.	18	8.5	8.5	89.10
	4.	5	2.4	2.4	91.50
	5.	4	1.9	1.9	93.40
	6.	3	1.4	1.4	94.80
	7.	5	2.4	2.4	97.20
	8.	1	.5	.5	97.60
	10.	2	.9	.9	98.60
	12.	2	.9	.9	99.50
	19.	1	.5	.5	100.00
		-----	-----	-----	
	TOTAL	211	100.0	100.0	

MEAN	1.550	STD ERR	.170	MEDIAN	.778
MODE	.000	STD DEV	2.463	VARIANCE	6.068
KURTOSIS	14.521	SKEWNESS	3.214	RANGE	19.000
MINIMUM	.000	MAXIMUM	19.000		
VALID CASES	211	MISSING CASES	0		



STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR188

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	47	22	22	6.	14	7	85	12.	6	3	98
1.	29	14	36	7.	3	1	86	15.	2	1	99
2.	26	12	48	8.	5	2	89	19.	2	1	100
3.	34	16	64	9.	5	2	91	24.	1	0	100
4.	18	9	73	10.	6	3	94				
5.	11	5	78	11.	2	1	95				

MEAN	3.536	STD ERR	.269	MEDIAN	2.803
MODE	.000	STD DEV	3.900	VARIANCE	15.212
KURTOSIS	4.983	SKEWNESS	1.931	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		
VALID CASES	211	MISSING CASES	0		

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR189

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	47	22	22	6.	14	7	85	12.	5	2	96
1.	31	15	37	7.	5	2	88	15.	2	1	99
2.	28	13	50	8.	4	2	90	18.	1	0	99
3.	33	16	66	9.	4	2	91	19.	1	0	100
4.	17	8	74	10.	6	3	94	24.	1	0	100
5.	10	5	79	11.	2	1	95				

MEAN	3.431	STD ERR	.264	MEDIAN	2.482
MODE	.000	STD DEV	3.830	VARIANCE	14.085
KURTOSIS	5.371	SKEWNESS	1.995	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 211 MISSING CASES 0

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR190

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	54	26	26	6.	12	6	90	15.	1	0	90
1.	41	19	45	7.	4	2	91	16.	1	0	99
2.	29	14	59	8.	4	2	93	17.	1	0	99
3.	26	12	71	9.	2	1	94	19.	1	0	100
4.	15	7	78	10.	3	1	96	24.	1	0	100
5.	12	6	84	12.	4	2	98				

MEAN	2.919	STD ERR	.250	MEDIAN	1.002
MODE	.000	STD DEV	3.626	VARIANCE	13.151
KURTOSIS	8.050	SKEWNESS	2.441	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 211 MISSING CASES 0

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR191

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	26	12	12	7.	9	4	67	14.	3	1	87
1.	20	9	22	8.	8	4	71	15.	3	1	88
2.	18	9	30	9.	7	3	74	17.	1	0	89
3.	28	13	44	10.	9	4	78	19.	2	1	90
4.	21	10	54	11.	3	1	80	20.	3	1	91
5.	5	2	56	12.	11	5	85	21.	2	1	92
6.	14	7	63	13.	1	0	85	24.	17	8	100

MEAN	6.839	STD ERR	.478	MEDIAN	4.143
MODE	3.000	STD DEV	6.943	VARIANCE	48.212
KURTOSIS	.747	SKEWNESS	1.304	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 211 MISSING CASES 0



STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR192

CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM
		PCT	PCT			PCT	PCT			PCT	PCT
0.	9	4	4	21.	1	0	47	51.	1	0	72
1.	6	3	7	22.	1	0	47	54.	1	0	72
2.	7	3	11	23.	1	0	48	56.	2	1	73
3.	13	6	17	24.	6	3	50	57.	1	0	74
4.	10	5	22	26.	2	1	51	58.	1	0	74
5.	5	2	24	27.	4	2	53	60.	7	3	77
6.	2	1	25	28.	1	0	54	62.	1	0	76
7.	3	1	26	30.	1	0	54	64.	1	0	76
8.	3	1	28	31.	1	0	55	66.	2	1	79
9.	1	0	28	32.	1	0	55	68.	1	0	80
10.	3	1	30	33.	1	0	56	72.	3	1	81
11.	3	1	31	34.	1	0	56	80.	1	0	82
12.	10	5	36	35.	3	1	58	84.	3	1	83
13.	4	2	38	36.	7	3	61	87.	1	0	84
14.	1	0	38	38.	3	1	63	91.	1	0	84
15.	3	1	40	39.	1	0	63	94.	1	0	85
16.	4	2	42	41.	1	0	63	96.	2	1	86
17.	2	1	43	42.	3	1	65	98.	1	0	86
18.	3	1	44	43.	3	1	66	99.	29	14	100
19.	2	1	45	48.	7	3	70				
20.	2	1	46	50.	3	1	71				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	3				

MEAN	36.649	STD ERR	2.381	MEDIAN	24.333
MODE	99.000	STD DEV	34.339	VARIANCE	1179.166
KURTOSIS	-.847	SKEWNESS	.745	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES	208	MISSING CASES	3
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR193

CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM
		PCT	PCT			PCT	PCT			PCT	PCT
0.	7	3	3	18.	5	2	44	51.	1	0	71
1.	6	3	6	19.	1	0	44	54.	1	0	71
2.	7	3	10	20.	1	0	45	56.	1	0	72
3.	9	4	14	21.	1	0	45	60.	7	5	75
4.	7	3	17	22.	2	1	46	62.	1	0	76
5.	7	3	21	24.	8	4	50	64.	2	1	77
6.	4	2	22	25.	1	0	51	65.	1	0	77
7.	2	1	23	26.	2	1	52	66.	1	0	78
8.	4	2	25	27.	5	2	54	72.	5	2	80
9.	2	1	26	32.	1	0	55	80.	1	0	80
10.	3	1	28	36.	12	6	60	84.	2	1	81
11.	3	1	29	38.	1	0	61	87.	1	0	82
12.	13	6	35	40.	1	0	61	91.	1	0	82
13.	4	2	37	41.	1	0	62	96.	3	1	84
14.	2	1	38	42.	5	2	64	97.	2	1	85
15.	4	2	40	43.	2	1	65	98.	1	0	85
16.	2	1	41	48.	8	4	69	99.	31	15	100
17.	1	0	42	50.	3	1	70				

MISSING DATA

CODE FREQ CODE FREQ CODE FREQ

9999. 2

MEAN	38.057	STD ERR	2.418	MEDIAN	24.437
MODE	99.000	STD DEV	34.951	VARIANCE	1221.545
KURTOSIS	-.969	SKEWNESS	.702	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES 209 MISSING CASES 2

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR194

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	2	1	1	23.	4	2	28	59.	1	0	61
1.	3	1	2	24.	12	6	34	60.	11	5	66
2.	2	1	3	25.	2	1	35	62.	1	0	67
3.	8	4	7	26.	3	1	37	64.	2	1	68
4.	8	4	11	27.	2	1	38	65.	2	1	69
5.	3	1	13	30.	5	2	40	66.	4	2	71
6.	2	1	13	32.	3	1	41	67.	3	1	72
7.	1	0	14	34.	1	0	42	69.	2	1	73
8.	4	2	16	35.	1	0	42	71.	1	0	74
9.	1	0	16	36.	9	4	47	72.	5	2	76
10.	1	0	17	37.	1	0	47	74.	1	0	76
12.	3	1	18	38.	2	1	48	75.	1	0	77
13.	3	1	20	41.	2	1	49	78.	1	0	77
14.	1	0	20	42.	1	0	50	79.	1	0	76
15.	1	0	21	45.	1	0	50	84.	4	2	80
16.	1	0	21	48.	9	4	54	85.	1	0	80
17.	3	1	23	49.	2	1	55	89.	2	1	81
18.	3	1	24	50.	2	1	56	91.	1	0	82
19.	1	0	25	54.	4	2	58	96.	1	0	82
20.	2	1	25	55.	1	0	59	99.	37	18	100
22.	2	1	26	57.	4	2	61				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	3				

MEAN	47.673	STD ERR	2.304	MEDIAN	45.500
MODE	99.000	STD DEV	33.225	VARIANCE	1103.892
KURTOSIS	-1.246	SKENNESS	.263	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES 208 MISSING CASES 3

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR195

CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM
		PCT	PCT			PCT	PCT			PCT	PCT
0.	31	15	15	7.	7	3	77	17.	1	0	92
1.	28	14	29	8.	10	5	82	18.	1	0	93
2.	25	12	41	9.	6	3	85	19.	1	0	93
3.	21	10	51	10.	5	2	87	20.	2	1	94
4.	17	8	59	11.	4	2	89	22.	1	0	95
5.	14	7	66	12.	5	2	91	24.	11	5	100
6.	16	8	73	15.	1	0	92				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	4				

MEAN	5.348	STD ERR	.422	MEDIAN	5.429
MODE	.000	STD DEV	6.069	VARIANCE	36.830
KURTOSIS	2.887	SKEWNESS	1.830	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 207 MISSING CASES 4



STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR196

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	7	3	3	13.	2	1	67	27.	1	0	89
1.	18	9	12	14.	2	1	67	28.	2	1	89
2.	16	8	20	15.	2	1	68	29.	1	0	90
3.	13	6	26	16.	5	2	71	30.	4	2	92
4.	12	6	32	17.	2	1	72	33.	3	1	93
5.	13	6	38	18.	6	3	75	36.	6	3	96
6.	12	6	44	19.	1	0	75	37.	1	0	97
7.	6	3	46	20.	2	1	76	39.	1	0	97
8.	6	3	49	21.	1	0	77	48.	4	2	99
9.	4	2	51	22.	3	1	78	60.	1	0	100
10.	6	3	54	24.	17	8	86	61.	1	0	100
11.	6	3	57	25.	3	1	88				
12.	18	9	66	26.	1	0	88				

MISSING DATA					
CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	2				

MEAN	12.627	STD ERR	.835	MEDIAN	8.675
MODE	1.000	STD DEV	12.076	VARIANCE	145.831
KURTOSIS	1.952	SKEWNESS	1.401	RANGE	61.000
MINIMUM	.000	MAXIMUM	61.000		

VALID CASES	209	MISSING CASES	2
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR197

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	6	3	3	14.	1	0	67	30.	2	1	91
1.	20	10	12	15.	2	1	67	31.	1	0	91
2.	17	8	21	16.	2	1	68	33.	1	0	92
3.	11	5	26	17.	1	0	69	35.	1	0	92
4.	18	9	34	18.	6	3	72	36.	4	2	94
5.	12	6	40	19.	2	1	73	38.	1	0	95
6.	14	7	47	20.	2	1	74	39.	1	0	95
7.	3	1	48	21.	2	1	75	48.	4	2	97
8.	4	2	50	22.	1	0	75	55.	1	0	98
9.	3	1	52	24.	26	12	88	60.	2	1	99
10.	4	2	54	26.	1	0	88	61.	1	0	99
11.	4	2	56	27.	2	1	89	84.	1	0	100
12.	21	10	66	28.	1	0	89	99.	1	0	100
13.	1	0	66	29.	1	0	90				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	2				

MEAN	13.526	STD ERR	1.029	MEDIAN	8.375
MODE	24.000	STD DEV	14.874	VARIANCE	221.250
KURTOSIS	7.349	SKEWNESS	2.261	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES	209	MISSING CASES	2
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR198

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	2	1	1	22.	2	1	33	41.	2	1	67
1.	2	1	2	23.	4	2	35	42.	2	1	68
2.	3	1	3	24.	37	18	53	44.	1	0	68
3.	2	1	4	25.	7	3	56	45.	1	0	69
4.	4	2	6	26.	7	3	60	46.	1	0	69
6.	8	4	10	27.	7	3	63	48.	5	2	92
8.	2	1	11	28.	3	1	64	50.	1	0	92
10.	2	1	12	29.	2	1	65	59.	2	1	93
11.	2	1	13	30.	6	3	68	60.	6	3	96
12.	8	4	17	32.	5	2	71	60.	1	0	97
14.	4	2	19	33.	1	0	71	68.	1	0	97
15.	4	2	21	34.	6	3	74	70.	1	0	98
16.	2	1	22	35.	3	1	75	72.	1	0	98
17.	2	1	23	36.	15	7	83	78.	1	0	99
18.	10	5	27	37.	3	1	84	92.	1	0	99
19.	4	2	29	38.	1	0	85	96.	1	0	100
20.	4	2	31	39.	2	1	86	99.	1	0	100
21.	2	1	32	40.	1	0	86				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	3				

MEAN	27.447	STD ERR	1.167	MEDIAN	24.338
MODE	24.000	STD DEV	16.834	VARIANCE	283.369
KURTOSIS	3.240	SKEWNESS	1.390	RANGE	99.000
MINIMUM	.000	MAXIMUM	99.000		

VALID CASES	208	MISSING CASES	3
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR199

CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM
		PCT	PCT			PCT	PCT			PCT	PCT
0.	43	21	21	8.	10	5	77	16.	5	2	93
1.	27	13	35	9.	5	2	79	18.	2	1	94
2.	20	10	45	10.	6	3	82	19.	1	0	95
3.	15	7	52	11.	5	2	85	20.	2	1	96
4.	8	4	56	12.	8	4	89	21.	2	1	97
5.	7	3	60	13.	1	0	89	24.	6	3	100
6.	18	9	69	14.	2	1	90				
7.	6	3	72	15.	1	0	91				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	11				

MEAN	5.410	STD ERR	.427	MEDIAN	3.167
MODE	.000	STD DEV	6.035	VARIANCE	36.424
KURTOSIS	1.430	SKEWNESS	1.403	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES	200	MISSING CASES	11
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR200

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	14	7	7	12.	7	3	69	27.	4	2	92
1.	24	12	19	13.	1	0	69	28.	1	0	92
2.	21	10	29	14.	3	1	71	29.	1	0	93
3.	14	7	36	15.	2	1	72	30.	2	1	94
4.	3	1	37	16.	2	1	73	32.	2	1	95
5.	2	1	38	18.	12	6	78	33.	1	0	95
6.	15	7	46	19.	3	1	80	36.	5	2	98
7.	6	3	49	20.	3	1	81	41.	1	0	98
8.	13	6	55	21.	2	1	82	42.	1	0	99
9.	8	4	59	22.	1	0	83	44.	1	0	99
10.	8	4	63	23.	2	1	84	60.	1	0	100
11.	5	2	65	24.	12	6	90	68.	1	0	100
M I S S I N G D A T A											
CODE	FREQ			CODE	FREQ			CODE	FREQ		
9999.	7										

MEAN	11.088	STD ERR	.804	MEDIAN	7.731
MODE	1.000	STD DEV	11.483	VARIANCE	131.854
KURTOSIS	3.656	SKEWNESS	1.656	RANGE	68.000
MINIMUM	.000	MAXIMUM	68.000		

VALID CASES 204 MISSING CASES 7

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR201

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	14	7	7	13.	2	1	67	27.	1	0	90
1.	25	12	19	14.	3	1	69	28.	1	0	91
2.	20	10	29	15.	6	3	72	29.	1	0	91
3.	12	6	35	16.	2	1	73	30.	4	2	93
4.	9	4	39	17.	2	1	74	31.	1	0	94
5.	3	1	41	18.	10	5	78	32.	3	1	95
6.	13	6	47	19.	3	1	80	33.	1	0	96
7.	5	2	50	20.	3	1	81	36.	4	2	98
8.	13	6	56	21.	1	0	82	38.	1	0	98
9.	4	2	58	23.	2	1	83	42.	1	0	99
10.	4	2	60	24.	9	4	87	44.	1	0	99
11.	4	2	62	25.	3	1	89	60.	1	0	100
12.	9	4	66	26.	2	1	90	68.	1	0	100

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	7				

MEAN	11.216	STD ERR	.811	MEDIAN	7.577
MODE	1.000	STD DEV	11.585	VARIANCE	134.219
KURTOSIS	3.316	SKEWNESS	1.581	RANGE	68.000
MINIMUM	.000	MAXIMUM	68.000		

VALID CASES	204	MISSING CASES	7
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR202

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	6	3	3	17.	2	1	59	34.	1	1	89
1.	15	8	11	18.	12	6	65	36.	4	2	91
2.	14	7	18	19.	4	2	67	37.	2	1	92
3.	8	4	22	20.	2	1	68	38.	2	1	93
4.	3	2	23	21.	3	2	70	42.	2	1	94
5.	4	2	25	22.	2	1	71	43.	1	1	95
6.	10	5	30	23.	1	1	71	44.	2	1	96
7.	9	5	35	24.	9	5	76	48.	1	1	96
8.	12	6	41	25.	3	2	77	50.	1	1	97
9.	4	2	43	26.	3	2	79	56.	1	1	97
10.	3	2	44	27.	5	3	81	59.	1	1	98
11.	2	1	45	28.	3	2	83	60.	1	1	98
12.	10	5	50	29.	2	1	84	61.	1	1	99
13.	5	3	53	30.	4	2	86	72.	1	1	99
14.	1	1	53	31.	2	1	87	80.	1	1	100
15.	6	3	56	32.	3	2	88				
16.	4	2	58	33.	1	1	89				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	12				

MEAN	16.286	STD ERR	1.036	MEDIAN	12.450
MODE	1.000	STD DEV	14.619	VARIANCE	213.721
KURTOSIS	2.438	SKEWNESS	1.398	RANGE	80.000
MINIMUM	.000	MAXIMUM	80.000		

VALID CASES	199	MISSING CASES	12
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSH - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR203

ADJ CUM				ADJ CUM				ADJ CUM			
CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT	CODE	FREQ	PCT	PCT
0.	49	25	25	7.	6	3	83	15.	1	1	95
1.	36	18	43	8.	7	4	86	16.	2	1	96
2.	25	13	56	9.	3	2	88	19.	1	1	97
3.	12	6	62	10.	6	3	91	20.	1	1	97
4.	15	8	69	11.	5	3	93	24.	5	3	100
5.	9	5	74	12.	2	1	94				
6.	12	6	80	14.	1	1	95				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	13				

MEAN	3.955	STD ERR	.361	MEDIAN	2.060
MODE	.000	STD DEV	5.086	VARIANCE	25.671
KURTOSIS	4.890	SKEWNESS	2.112	RANGE	24.000
MINIMUM	.000	MAXIMUM	24.000		

VALID CASES 198 MISSING CASES 13



STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR204

CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM
		PCT	PCT			PCT	PCT			PCT	PCT
0.	14	7	7	11.	7	4	77	24.	7	4	95
1.	37	19	26	12.	9	5	82	25.	2	1	96
2.	25	13	38	13.	2	1	83	26.	1	1	97
3.	14	7	45	14.	1	1	83	29.	1	1	97
4.	16	8	53	15.	2	1	84	30.	1	1	98
5.	6	3	56	16.	2	1	85	32.	1	1	98
6.	14	7	63	18.	8	4	89	33.	1	1	99
7.	6	3	66	19.	2	1	90	36.	1	1	99
8.	8	4	70	20.	1	1	91	38.	1	1	100
9.	2	1	71	21.	1	1	91				
10.	5	3	74	23.	1	1	92				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	12				

MEAN	7.317	STD ERR	.571	MEDIAN	4.094
MODE	1.000	STD DEV	8.060	VARIANCE	64.965
KURTOSIS	1.945	SKEWNESS	1.560	RANGE	38.000
MINIMUM	.000	MAXIMUM	38.000		

VALID CASES	199	MISSING CASES	12
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR205

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.	15	7	7	11.	6	3	76	25.	2	1	95
1.	40	20	27	12.	12	6	82	26.	1	0	96
2.	26	13	40	14.	2	1	83	29.	2	1	97
3.	13	6	47	15.	2	1	84	30.	1	0	97
4.	13	6	53	16.	4	2	86	32.	1	0	98
5.	8	4	57	18.	9	4	90	35.	1	0	98
6.	9	4	62	19.	1	0	91	36.	1	0	99
7.	9	4	66	20.	1	0	91	38.	1	0	99
8.	2	1	67	21.	1	0	92	48.	1	0	100
9.	7	3	71	23.	1	0	92				
10.	4	2	73	24.	4	2	94				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	11				

MEAN	7.425	STD ERR	.605	MEDIAN	3.962
MODE	1.000	STD DEV	8.558	VARIANCE	73.241
KURTOSIS	3.491	SKEWNESS	1.803	RANGE	48.000
MINIMUM	.000	MAXIMUM	48.000		

VALID CASES	200	MISSING CASES	11
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STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES SPSSM - RELEASE 6.04

FILE TANK (CREATION DATE = 20 DEC 77)

VAR206

CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM	CODE	FREQ	ADJ	CUM
		PCT	PCT			PCT	PCT			PCT	PCT
0.	8	4	4	13.	1	1	62	27.	2	1	86
1.	14	7	11	14.	2	1	63	28.	5	2	87
2.	17	9	20	15.	2	1	64	29.	2	1	88
3.	8	4	24	16.	5	5	66	30.	5	2	90
4.	9	5	28	18.	10	5	71	32.	2	1	91
5.	5	3	31	19.	2	1	72	33.	1	1	91
6.	16	8	39	20.	4	2	74	36.	9	5	96
7.	9	5	43	21.	3	2	76	37.	1	1	96
8.	8	4	47	22.	1	1	76	39.	1	1	97
9.	7	4	51	23.	2	1	77	41.	2	1	98
10.	5	3	53	24.	12	6	83	43.	1	1	98
11.	5	3	56	25.	1	1	84	48.	2	1	99
12.	11	6	61	26.	2	1	85	71.	1	1	100

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
9999.	12				

MEAN	13.447	STD ERR	.866	MEDIAN	9.286
MODE	2.000	STD DEV	12.221	VARIANCE	149.360
KURTOSIS	1.788	SKEWNESS	1.251	RANGE	71.000
MINIMUM	.000	MAXIMUM	71.000		

VALID CASES	199	MISSING CASES	12
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